

Amendments to the Specification:

Please amend the specification as follows:

[0052] FIG. 1A 3 is a diagram of an ion source 10. The details of its construction, as well as its preferred modes of ionizing action, are disclosed in detail by Horsky et al., International Application No. PCT/US03/20197, filed Jun. 26, 2003: "An ion implantation device and a method of semiconductor manufacturing by the implantation of boron hydride cluster ions", and by Horsky, U.S. patent application Ser. No. 10/183,768, "Electron impact ion source", filed Jun. 26, 2002, U.S. Pat. No. 6,686,595, each herein incorporated by reference. The ion source 10 is made to interface to an evacuated vacuum chamber of an ion implanter by way of a mounting flange 36. Thus, the portion of the ion source 10 to the right of flange 36, shown in FIG. 3 1A, is under a high vacuum (pressure $<1 \times 10^{-4}$ Torr). The ion source is maintained at an elevated voltage by a high voltage power supply and is electrically isolated from remaining portions of the high vacuum housing. Gaseous material is introduced into ionization chamber 44 in which the gas molecules are ionized by electron impact from electron beam 70A or 70B. The electron beam exits ionization chamber 44 through the opposite aperture 71B or 71A, or may be absorbed by a beam dump or walls of the chamber acting as a beam dump. In one embodiment incorporating a single electron gun and a beam dump, shown in FIG. 1B, the electron beam originates from a cathode in the electron gun 112, is bent by a magnetic field 135 produced by magnet 130 and pole pieces 125, and enters the ionization chamber 44 through electron entrance aperture 71A or 71B such that electron beam 70A or 70B moves parallel to an elongated ion extraction aperture 81. After leaving ionization chamber 44 the electron beam 70 is stopped by beam dump 72 located external to ionization chamber 44. Thus, ions are created adjacent to the ion extraction aperture 81, which appears as a slot in the ion extraction aperture plate 80. The

ions are then extracted and formed into an energetic ion beam by an extraction electrode (not shown) located in front of the ion extraction aperture plate 80, and held at a substantially lower voltage.

[0053] Referring again to FIG. 1B 4A, gases may be fed into the ionization chamber 44 via a gas conduit 33. Solid feed materials such as decaborane and octadecaborane can be vaporized in vaporizer 28, and the vapor fed into the ionization chamber 44 through vapor conduit 32 within the source block 35. Typically, ionization chamber 44, ion extraction aperture 80, source block 35 (including vapor feed conduit 32), and vaporizer housing 30 are all fabricated of aluminum. Solid feed material 29 (Fig. 1), located under a perforated separation barrier 34a (Fig. 5), is held at a uniform temperature by closed-loop temperature control of the vaporizer housing 30 (Fig. 5). Sublimated vapor 50 (Fig. 1) which accumulates in a ballast volume 31 feeds through conduit 39 and through throttling valve 100 and shutoff valve 110 (Fig. 3). The nominal pressure of vapor 50 (Fig. 1) between throttling valve 100 (Fig. 1) and shutoff valve 110 (Fig. 3) is monitored by capacitance manometer gauge 60 (Fig. 1). The vapor 50 feeds into the ionization chamber 44 through a vapor conduit 32, located in the source block 35. Thus, both gaseous and vaporized materials may be ionized by this ion source.